Design Element				Manual Section	Design Values (By Type of Area)		
					Suburban	Intermediate	Built-Up
Design Controls	Design Forecast Year			40-2.02	20 Years	20 Years	20 Years
	*Design Speed (km/h) (2)			40-3.0	Curbed: 50-60 Uncurbed: 50-70	Curbed: 50-60 Uncurbed: 50-60	Curbed: 40-60
	Access Control			40-5.0	None	None	None
	Level of Service			40-2.0	Desirable: C; Minimum: D	Desirable: C; Minimum: D	D
	On-Street Parking			45-1.04	Optional (3)	Optional (3)	Optional (3)
Cross Section Elements	Travel Lane	*Width (4)		45-1.01	Curbed: 3.3 m Uncurbed: 3.3 m	Curbed: 3.0 m Uncurbed: 3.3 m	Curbed: 3.0 m
		Typical Surface Type		Chp. 52	Asphalt / Concrete	Asphalt / Concrete	Asphalt / Concrete
	*Curb Offset (5)			45-1.02	0.6 m	0.6 m	0.6 m
	Shoulder	*Usable Width		45-1.02	Des: 1.2 m; Min: 0.6 m	Des: 1.2 m; Min: 0.6 m	Des: 1.2 m; Min: 0.6 m
		Typical Surface Type		Chp. 52	Asphalt / Concrete / Aggregate / Earth	Asphalt / Concrete / Aggregate / Earth	Asphalt / Concrete / Aggregate / Earth
	Cross Slope	*Travel Lane (6)		45-1.01	2%	2%	2%
		Shoulder		45-1.02	4%-6% Asph. / Conc.; 6%-8% Aggr.; 8% Earth	4%-6% Asph. / Conc.; 6%-8% Aggr.; 8% Earth	4%-6% Asph. / Conc.; 6%-8% Aggr.; 8% Earth
	Auxiliary Lanes	Lane Width		45-1.03	Des: 3.3 m; Min: 3.0 m	Des: 3.3 m; Min: 3.0 m	3.0 m
		Curb Offset			Des: 0.3 m; Min: 0.0 m	Des: 0.3 m; Min: 0.0 m	Des: 0.3 m; Min: 0.0 m
		Shoulder Width			Des: 1.2 m; Min: 0.6 m	Des: 1.2 m; Min: 0.6 m	Des: 1.2 m; Min: 0.6 m
		Typical Surface Type		Chp. 52	Asphalt / Concrete / Aggregate / Earth	Asphalt / Concrete / Aggregate / Earth	Asphalt / Concrete / Aggregate / Earth
	Parking Lane Width (1)			45-1.04	Des: 2.7 m; Min: 2.4 m	Des: 2.7 m; Min: 2.4 m	Des: 2.7 m; Min: 2.4 m
	Sidewalk Width (7)			45-1.06	1.5 m with 1.5 m Buffer (Des)	1.5 m with 1.5 m Buffer (Des)	Varies, 1.8 m Min
	Bicycle Lane Width (8)			51-7.0	Curbed: 1.5 m Uncurbed: Shld. Width +1.2 m	Curbed: 1.5 m Uncurbed: Shld. Width +1.2 m	Curbed: 1.5 m
	Clear Zones			49-2.0	(9)	(9)	(9)
	Typical Curbing Type (where used)			45-1.05	Vertical / Sloping	Vertical / Sloping	Vertical / Sloping
	Side Slopes (Uncurbed)	Cut	Foreslope	45-3.0	3:1 Max	3:1 Max	N/A
			Ditch Width		Des: 1.2 m; Min: 0.0 m	Des: 1.2 m; Min: 0.0 m	N/A
			Backslope		3:1 Max (10)	3:1 Max. (10)	N/A
		Fill			3:1 Max	3:1 Max.	N/A
	Side Slopes (Curbed)	Cut (Backslope)		45-3.0	(11)	(11)	(11)
		Fill (12)			12:1 for 3.6 m; 3:1 Max to Toe	12:1 for 3.6 m; 3:1 Max to Toe	12:1 for 3.6 m; 3:1 Max to Toe

* Controlling design criteria (see Section 40-8.0).
** Table applies only to projects with Federal-aid funds.
Des: Desirable; Min: Minimum.

GEOMETRIC DESIGN CRITERIA FOR URBAN LOCAL STREETS **
(New Construction / Reconstruction)

Table 53-9

Design Element			Manual Section	Design Values (By Type of Area)				
				Suburban	Intermediate	Built-Up		
Bridges	New and Reconstructed Bridges	*Structural Capacity	Chp. 60	HS-20	HS-20	HS-20		
		*Clear Roadway Width	45-4.01	Curbed: Full Approach Curb-to-Curb Width Uncurbed: (13)				
	Existing Bridges to Re-main in Place	*Structural Capacity	Chp. 60	HS-20	HS-20	HS-20		
		*Clear Roadway Width	45-4.01	Existing Width (14)				
	*Vertical Clearance (Local Under) (15)	New and Replaced Overpassing Bridges (15)	44-4.0	4.45 m	4.45 m	4.45 m		
		Existing Overpassing Bridges		4.30 m	4.30 m	4.30 m		
	Vertical Clearance (Local over Railroad) (16)		Chp. 69	7.00 m				
Alignment Elements	Design Speed			30 km/h	40 km/h	50 km/h	60 km/h	70 km/h
	*Stopping Sight Distance	Desirable	42-1.0	35	50 m	65 m	85 m	105 m
	Decision Sight Distance	Speed / Path / DirectionChange	42-2.0	U: 120 m SU: 100 m	U: 160 m SU: 130 m	U: 195 m SU: 170 m	U: 235 m SU: 205 m	U: 275 m SU: 235 m
		Stop Maneuver		90 m	130 m	155 m	195 m	235 m
	Intersection Sight Distance, -3% to +3% (22)		46-10.0	P: 65 m SU: 80 m	P: 85 m SU: 110 m	P: 105 m SU: 135 m	P: 125 m SU: 160 m	P: 150 m SU: 185 m
	*Minimum Radii		43-2.0	20 m (17)	45 m (17)	80 m (17)	130 m (17)	185 m (17)
	*Superelevation Rate (18)		43-3.0	e_{max} = 4%				
	*Horizontal Sight Distance		43-4.0	(19)				
	*Vertical Curvature (K-values)	Crest	44-3.0	2	4	7	11	17
		Sag		6	9	13	18	23
	*Maximum Grade (20)	Level	44-1.02	10%	10%	10%	9%	8%
		Rolling		15%	11%	11%	10.5%	10%
	Minimum Grade		44-1.03	Desirable: 0.5%; Minimum: 0.3% (Curbed) (21) 0.0% (Uncurbed)				

* Controlling design criteria (see Section 40-8.0). U: Urban; SU: Suburban.
** Table applies only to projects with Federal-aid funds.

See note at bottom of Table 53-4 for Level One design criteria exception approval authority for Federally funded urban local streets.

GEOMETRIC DESIGN CRITERIA FOR URBAN LOCAL STREETS **
(New Construction/Reconstruction)

Table 53-9 (Continued)

GEOMETRIC DESIGN CRITERIA FOR URBAN LOCAL STREETS
(New Construction/Reconstruction)
Footnotes to Table 53-9

(1) Parking Lanes. In residential areas, the minimum width is 2.1 m. In commercial and industrial areas the minimum is 2.4 m. Where curb and gutter sections are used, the gutter width should be considered part of the parking lane width.

(2) Design Speed. The minimum design speed should equal a) the minimum value from the table, b) the anticipated posted speed limit after construction or c) the state legal limit on non-posted highways, whichever is greater. The legal limit in urban districts is 50 km/h. Based upon an engineering study, these speeds may be raised to an absolute maximum of 90 km/h.

(3) On-Street Parking. In general, on-street parking is discouraged.

(4) Travel Lane Width. In restricted areas and where there are few trucks, travel lanes 0.3 m narrower may be used but may not be less than 3.0 m. In industrial areas, a 3.6-m travel lane should be used. In many residential areas, an 8.0-m roadway (curb face to curb face) consisting of one 3.6-m lane and two 2.2-m parking lanes is used. In industrial areas, 3.6-m lanes are desirable and 3.3-m lanes are minimum.

(5) Curb Offset. The curb offset should be 0.6 m. In restricted locations, a continuous vertical curb may be offset 0.3 m, and a sloping curb offset may be zero.

(6) Cross Slope (Travel Lanes). Cross slopes of 1.5% are acceptable on existing bridges to remain in place.

(7) Sidewalk Width. Buffers less than 0.6 m wide are not allowed. If no buffer is provided, the sidewalk width should be 1.8 m.

(8) Bicycle Lane Width. The widths in the table are in addition to the width of parking lanes, if present. See Section 51-7.0 for additional details.

(9) Clear Zones. The following will apply:

a. Facilities with Vertical Curbs. The clear zone will be measured from the edge of travel lane or will be to the right-of-way line, whichever is less. No clear zone is required where there is 24-hour parking.

b. Facilities with Sloping Curbs or without Curbs. The clear zone will vary according to design speed, traffic volumes, side slopes and horizontal curvature.

c. All Curbed Facilities. There should be an appurtenance-free area as measured from the gutter line of any curb.

d. Values. See Section 49-2.0 for specific clear zone values.

(10) Backslopes. Backslopes for rock cuts will vary according to the height of the cut and geotechnical factors. See *INDOT Standard Drawings* for typical rock cut sections.

(11) Side Slopes (Curbed) Cut. Typically, a shelf or sidewalk will be present immediately behind the curb before the toe of the backslope. The minimum width of a shelf will be 1.8 m; where sidewalks are present, the toe of the backslope will typically be 0.3 m beyond the edge of sidewalk. See Section 45-3.0 for more information.

(12) Side Slopes (Curbed) Fill. If no sidewalks are present or planned, the lateral extent of the 12:1 slope may be reduced to 1.2 m.

(13) Width (New and Reconstructed Bridges) Uncurbed. The following will apply:

Volume	Minimum Clear Width
$0 < AADT < 400$	Travelway +0.6 m each side
$400 \leq AADT < 2000$	Travelway +0.9 m each side
$AADT \geq 2000$	Approach Roadway Width (Travelway Plus Shoulders)

(14) Width (Existing Bridges to Remain in Place). If the width of the existing bridge is less than the approach travelway width, consideration should be given to widening the bridge. For such bridges of length greater than 60 m, the minimum shoulder width on the right and the left may be 1.1 m.

(15) Vertical Clearance (Local Under). Table values include an additional 150-mm allowance for future pavement overlays. Vertical clearances apply from usable edge to usable edge of shoulders.

(16) Vertical Clearance (Local Over Railroad). See Chapter Sixty-nine for additional information on railroad clearances under highways.

(17) Minimum Radii. Based on e_{max}=4% and low-speed urban street conditions.

(18) Superelevation Rate. See Section 43-3.0 for values of superelevation based on design speed and radii. See Section 43-3.0 for information on superelevation requirements.

(19) Horizontal Sight Distance. For a given design speed, the necessary middle ordinate will be determined by the radius and the sight distance which applies at the site. See the discussion in Section 43-4.0.

(20) Maximum Grades. In residential areas, the maximum grade should not exceed 15%. In industrial and commercial areas, the maximum grade should not exceed 8%.

(21) Flat Terrain. In very flat terrain and where no drainage outlet is available, gutter grades as low as 0.2% may be used.

(22) Intersection Sight Distance. For left turn onto a 2-lane road. P = Passenger car; SU = single unit truck. See Figure 46-10G for values for combination trucks.